

ON A COLLECTION OF UNSTALKED CRINOIDS MADE BY
THE UNITED STATES FISHERIES STEAMER "ALBA-
TROSS" IN THE VICINITY OF THE PHILIPPINE ISLANDS.

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The third consignment of crinoids received from the U. S. Fisheries steamer *Albatross*, collected during her cruise among the Philippine and neighboring islands, proves to be much more interesting than either of the two previously received. In the first place it is very rich both in individuals and in species, being much the largest collection ever received from any single area; secondly, it contains a remarkable proportion of hitherto unknown forms.

Altogether fifty-nine species are represented, of which twenty-four are new; five have been rediscovered for the first time since the *Challenger* collected them between October, 1874, and January, 1875, and one has been found which has not been collected in the Philippines, from which locality the type was described, since 1866. Numerous species of which I gave preliminary diagnoses from material obtained by the Royal Indian Marine Surveying Ship *Investigator* have again come to light, and one of them, known previously from only a single example, proves to be abundant.

On the other hand, forty species previously secured by the *Albatross* in this region are not represented, and six species originally described from the Philippines by Carpenter yet remain to be rediscovered.

As we know it to-day the comatulid fauna of the Philippine Archipelago comprises about one hundred and five species, while the facts known in regard to the adjacent seas indicate the occurrence there of two or three score more.

Suborder OLIGOPHREATA.

Family COMASTERIDÆ.

Subfamily CAPILLASTERINÆ.

Genus CAPILLASTER.

CAPILLASTER SENTOSA (P. H. Carpenter).

Station 5355.—One small specimen.

Station 5481.—One specimen with fifty arms 90 mm. long and cirri XX, 27–35, 25 mm. to 30 mm. (usually 27 mm.) long.

Station 5482.—One specimen with forty-one arms 120 mm. long and cirri XXI, 27–30 (usually 28) 25 mm. to 30 mm. (usually 27 mm.) long.

Station 5483.—One specimen with thirty-seven arms 110 mm. long and cirri XXVIII, 27–31, 25 mm. to 30 mm. (usually 27 mm.) long.

CAPILLASTER MULTIRADIATA (Linnæus).

Station 5249.—One small specimen.

Station 5276.—Two specimens, one with thirteen, the other with about twenty arms; the brachials are very short with almost perfectly straight borders.

Station 5355.—One small specimen with arms about 70 mm. long; the right anterior radial is axillary, giving rise to two IBr series, one with one IIBr series and three arms, the other with two IIBr series and four arms. The IBr series arising from the axillary radial are spread out laterally exactly as IIBr series diverge from a IBr axillary, so that the anterior and the right posterior rays are much crowded. The left anterior ray is nearly twice the normal size, but of the five arms which it bears only one, which springs undivided from the IIBr axillary, is enlarged; the others, however, have just finished undergoing adolescent autotomy and may not have reached their full size.

Station 5482.—One specimen with about thirty arms.

Genus COMATELLA.

COMATELLA NIGRA (P. H. Carpenter).

Station 5356.—One specimen with twenty-nine arms 170 mm. long and cirri XXIII, 29–36, 30 mm. to 42 mm. long. The IIBr series bear a IIIBr series externally and an undivided arm internally except in one case where a IIBr series bears merely two undivided arms.

Station 5413.—One fine specimen with forty arms 170 mm. long and cirri XXI, 30–32, 30 mm. to 33 mm. long.

In the number of arms and in the arrangement of the arm divisions these specimens resemble typical *stelligera* instead of typical *nigra*; but in the structure of the cirri and pinnules and in all other points

they agree with *nigra*. It would thus appear that, while the frequency of the arm division can usually be relied upon to separate these two species, it is not so diagnostic as the characters presented by the centrodorsal and the cirri.

Genus COMISSIA.

COMISSIA LÜTKENI (A. H. Clark).

Station 5483.—Two specimens, closely resembling the type and cotype, but darker in color. The arms are dark greenish yellow, the pinnules chrome yellow, the cirri dull greenish yellow with dusky bands. One of the specimens has the mouth central and the anal tube marginal; the disk of the other is lacking.

COMISSIA DUMETUM, new species.

This new form is in general similar to *C. lütkeni*. The cirri, however, are more slender, the longer proximal segments somewhat more strongly constricted centrally, the distal with the dorsal processes slightly more pronounced; the cirri of the type are XV, 26–27, 15 mm. to 17 mm. long.

The ten arms of the type resemble those of *C. lütkeni* and are about 100 mm. long.

The pinnules are as in *C. lütkeni*, but the distal ends of the segments are more prominent and more spinous, and the dorsal surface is much more spinous. The spine at the ventral distal angles of the segments of the middle and distal pinnules is much longer than in *C. lütkeni* and somewhat more slender; on the outer segments its length is equal to the transverse diameter of the segment bearing it; it may be more or less branched, especially at the tip.

The color is olive green, the cirri blotched with lighter.

Type.—Cat. No. 27484, U.S.N.M., from station 5356.

Ten additional specimens were secured at this station.

COMISSIA HISPIDA, new species.

Centrodorsal thin-discoidal, the dorsal pole flat, 3.5 mm. in diameter; cirrus sockets in a single fairly regular marginal row.

Cirri XXII, 9–10, 8 mm. long; first segment very short, second about twice as broad as long, third the longest, about four times as long as the proximal diameter, a transition segment; next segment about twice as long as broad, the remainder about as long as broad; the second segment has both ends somewhat expanded; the third has the distal end somewhat expanded, this character dying away on the succeeding segments; the segments as far as the third are rounded in cross section, the remainder laterally flattened so that they appear considerably broader in lateral view; the fourth and following have small subterminal median dorsal tubercles; opposing spine small, median in position.

Mouth subcentral, anal tube submarginal.

Ends of the basal rays visible as small tubercles in the angles of the calyx; radials concealed in the median line but visible interradially as broad low triangles; IBr_1 exceedingly short, six to eight times as broad as long; IBr_2 triangular, not greatly broader than long, the anterior angle acute and somewhat produced.

Ten arms probably about 60 mm. long, resembling those of *Comissia lütkeni*; the lower brachials are triangular, about as long as broad; the arm increases slightly in diameter up to the twelfth or fourteenth brachial, then gradually tapers distally; the distal intersyzygial interval is three oblique muscular articulations.

P_1 12 mm. to 14 mm. long, very slender, with forty segments; terminal comb composed of from fifteen to seventeen long curved teeth set very closely together basally; P_2 12 mm. long resembling P_1 with a comb of fourteen teeth; P_3 9 mm. long resembling P_2 ; P_4 8 mm. long with a comb of fourteen teeth; P_5 7.5 mm. long with a similar comb; P_6 somewhat stouter than the preceding pinnules, 5 mm. long, with a rudimentary comb; following pinnules resembling P_6 , but without combs; the distal pinnules are slender, 9 mm. long.

Color, yellow.

Type.—Cat. No. 27485, U.S.N.M., from station 5431.

Subfamily COMACTINIINÆ.

Genus COMATULA.

COMATULA PECTINATA (Linnæus).

Station 5276.—One fine specimen with only six rather short and slender cirri; these are irregular in position, not being segregated in the interradiial angles like the cirri of *C. purpurea*.

Station 5358.—One fine specimen with the cirri XIV, 13, 13 mm. to 15 mm. long, rather stout.

Subfamily COMASTERINÆ.

Genus COMASTER.

COMASTER FRUTICOSUS, new species.

Centrodorsal discoidal with a broad flat bare polar area 2 mm. to 2.5 mm. in diameter.

Cirri slender, XXVII–XXX, 8–10 (usually 9) 7 mm. to 9 mm. long; the first segment is much broader than long, the second is about twice as long as its median breadth, and the third is the longest, three times as long as the median breadth; the fourth is somewhat shorter than the third, a transition segment; the following segments gradually become shorter, the antepenultimate being about as long as broad and the penultimate slightly broader than long; the transition and following segments have slight dorsal processes, as in the other small species of the genus.

IIBr 4 (3 + 4); IIIBr 2; IVBr 2, but rarely developed; thirty-seven to sixty-three very slender arms 90 mm. in length, resembling, with the division series, those of the related species; the projection of the distal edges of the brachials is very marked.

The color is brownish yellow.

Type.—Cat No. 27486, U.S.N.M., from station 5356.

Three additional specimens were secured at this station.

COMASTER DISTINCTA (P. H. Carpenter).

Station 5356.—One specimen with thirty arms 80 mm. long and cirri VIII, 10.

Station 5401.—Three specimens; one has thirty-three arms about 75 mm. long and cirri XXIII, 11; the two others are immature.

Station 5414.—One specimen with thirty arms 80 mm. long and cirri XV, 11, 7 mm. to 8 mm. long.

Station 5477.—Two specimens; one has thirty-one arms 100 mm. long and cirri XI, 11–12; the other is small with twenty arms 85 mm. long.

This species is nearest to *C. serrata* of southern Japan; but in *C. serrata* the third and fourth cirrus segments are much elongated, three times as long as broad, and the other segments are proportionately long; although *C. serrata* is a considerably smaller species, its cirri are actually longer, about 10 mm. in length.

Comaster parvus also bears a close resemblance to this species in many ways, but is easily distinguished by its more numerous arms and longer cirrus segments. The longest cirrus segment of *C. distincta*, the fourth, is about twice as long as broad.

In my report upon the comatulids collected by Mr. Alan Owston along the southern Japanese coast^a the two examples listed under "*Comaster parvicirra*" (p. 306) should have been referred to *Comaster serrata*.

COMASTER (?) HORRIDUS, new species.

Centrodorsal thin discoidal, the bare polar area 1 mm. in diameter; cirri in a single closely crowded irregularly alternating marginal row.

Cirri XVII, 14–15, 10 mm. long; first joint short, second somewhat longer than broad, third twice as long as its expanded ends, fourth or fifth the longest, two and one-half or three times as long as its expanded distal end; next very slightly shorter, usually a transition segment; following segments decreasing in length, the distal three or four being about as long as broad and the penultimate somewhat broader than long; transition and following segments with minute median subterminal dorsal tubercles; terminal claw half again as long as the penultimate segment, slender, moderately curved;

^a Proc. U. S. Nat. Mus., vol. 34, pp. 305–319.

second and following segments with expanded ends and rounded in section becoming after the fifth flattened laterally and much broader in lateral view.

Radials even with the edge of the centrodorsal in the median line, but extending well up into the interradiial angles and entirely separating the bases of the IBr_1 ; IBr_1 oblong or slightly trapezoidal, twice as broad as long, widely separated laterally; IBr_2 pentagonal, about as broad as long, the lateral edges slightly shorter than those of the IBr_1 and making with them a broadly obtuse angle.

Ten arms about 55 mm. long; first brachial nearly oblong, about twice as broad as long externally, interiorly in contact basally; second brachial about the same size but longer externally and shorter internally; third and fourth brachials (syzygial pair) about as long as broad; next two brachials approximately oblong, half again as long as broad, the following becoming obliquely wedge-shaped, somewhat longer than broad, and gradually increasing in length distally, the terminal brachials being twice as long as broad. The division series have slightly prominent and finely spinous distal ends; after the sixth the brachials develop strongly overlapping and very spinous distal edges.

P_1 10 mm. long with about thirty-nine segments, those after the fourth being about as long as broad; the long terminal comb consists of about twenty-five long curved teeth set closely together; P_2 6 mm. long, with a similar comb; P_3 6 mm. long, with a comb consisting of eighteen teeth; P_4 very slender, 6 mm. long, with a comb of twenty-one teeth, occupying rather more than its distal half; P_5 very slender and delicate, 4 mm. long, without a comb; following pinnules gradually increasing in length, the distal pinnules, which are very slender with greatly elongated segments, being 6 mm. long.

The color is yellowish brown.

Type.—Cat. No. 27487, U.S.N.M., from station 5356.

COMASTER (?) SCITULUS, new species.

Centrodorsal thin discoidal, the dorsal pole flat, 1.5 mm. in diameter.

Cirri XIX, 10–12, 5 mm. to 6 mm. long; first segment short, second somewhat longer than the diameter of its expanded ends, third two to two and one-half times as long as its expanded ends, fourth the longest, about four times as long as the diameter of its proximal end, a transition segment; following segments becoming very rapidly shorter, and at the same time becoming laterally compressed and increasing in lateral diameter, the penultimate segment being twice as broad as long; fourth and following with thickened distal dorsal edges and small sharp subterminal dorsal tubercles, which become central on the antepenultimate; opposing spine prominent but small, terminal, erect, or nearly erect, in height equal to about one-

third the lateral diameter of the penultimate segment; second and third segment with considerably expanded ends; fourth with the distal end much expanded, this character gradually dying away distally; terminal claw nearly twice as long as the penultimate segment, rather slender, and moderately curved.

Radials concealed; IBr_1 very short, oblong, about four times as broad as long, in apposition laterally; IBr_2 nearly triangular, twice as broad as long, with a shallow groove on the dorsal side at the anterior angle as in *Comatula pectinata*.

Ten arms about 60 mm. long; first brachial wedge shaped, about three times as broad as long exteriorly, basally united interiorly; second brachial more obliquely wedge shaped, about twice as broad as long exteriorly; third and fourth brachials (syzygial pair) nearly twice as broad as long; next two nearly oblong, about twice as broad as long, the following becoming very obliquely wedge shaped, nearly triangular and nearly as long as broad, and further out less obliquely wedge shaped, as long as broad, and longer than broad terminally. The IBr series and first two brachials have everted and spinous distal ends; the following brachials have strongly produced and overlapping coarsely spinous distal ends. Syzygies occur between the third and fourth brachials, again between the tenth and eleventh to thirteenth and fourteenth (usually in the latter position) and distally at intervals of three oblique muscular articulations.

P_1 7 mm. long with about twenty-five segments, all about as long as broad; their dorsal surface is excessively spinous, and frills of long spines fringe their distal edges; the terminal comb consists of seven or eight small and well-separated teeth, which are repeated, somewhat smaller, on the inner side of the pinnule; P_2 4 mm. long, with sixteen to twenty segments, similar to P_1 ; P_3 somewhat larger, 5 mm. long, with eighteen to twenty segments, the third-seventh or third-eighth with a genital gland, and a terminal comb; P_4 and following pinnules 4 mm. long, somewhat stouter than P_3 , without terminal combs, composed of about twelve very spiny segments; the distal pinnules are very slender, about 5 mm. long.

The color is greenish.

Type.—Cat. No. 27488, U.S.N.M., from station 5356.

Genus COMANTHUS.

Subgenus COMANTHERIA.

COMANTHUS (COMANTHERIA) BRIAREUS (Bell).

Station 5321.—One specimen.

Mahinog, Caunguin Island.—One specimen with about sixty-five arms.

Subgenus COMANTHINA.

COMANTHUS (COMANTHINA) SCHLEGELII (P. H. Carpenter).

Ulugan Bay, Palawan.—One fine large specimen, with about one hundred arms 155 mm. long; seven large functional cirri 13 mm. in length remain, all on the anterior semicircumference of the centrodorsal.

Examination of the type of Carpenter's *Actinometra schlegelii* at the Leyden Museum has disclosed the fact that it is exactly the same thing as the *Actinometra nobilis* and *Act. regalis* described in the *Challenger* report, Carpenter having overlooked at the time the characteristic arm structure which he described later in *Act. nobilis*.

Subgenus COMANTHUS.

Specific Group VALIDIA.

COMANTHUS (COMANTHUS) ANNULATA (Bell).

Station 5321.—One specimen with forty arms; one of the IIIBr series is 2.

Station 5599.—One specimen with forty-two arms; two of the IIIBr series are 2. Neither of these specimens have any cirri.

Tulayan Island.—One specimen with forty-six arms 100 mm. long; the brachials are rather strongly overlapping; one of the IIIBr series is 2, another is 8 (3+4; 7+8); there are three cirri remaining.

Thanks to the kindness and courtesy of Prof. Jeffrey Bell I have recently been able to examine the type of his *Actinometra annulata* at the British Museum, and I find that it is the same species as that later described in the *Challenger* report as *Actinometra valida*.

COMANTHUS (COMANTHUS) PARVICIRRA (J. Müller).

Station 5413.—One specimen with nineteen arms 95 mm. long; one of the IIBr series bears two IIIBr series; twelve cirri are present in a partially deficient row.

Station 5414.—One specimen with fifteen arms 95 mm. long; there are five IIBr series present, three 2, two 4 (3+4); the arms are long and slender with the brachials more strongly overlapping than usual; two small cirri 5 mm. long remain on a centrodorsal barely raised above the radials.

On the basis of Carpenter's statements in the *Challenger* report I have hitherto called this species *rotalaria*, but upon examining the types of *rotalaria* at Paris I find that it is the same thing as the form called *jukesii* by Carpenter and *paucicirra* by Bell. *Parvicirra* is the next available name.

Family ZYGOMETRIDÆ.

Genus ZYGOMETRA.

ZYGOMETRA COMATA (A. H. Clark).

Station 5358.—One specimen with twenty-eight arms 110 mm. long, resembling others from Singapore in the collection of the University of Copenhagen.

ZYGOMETRA PRISTINA, new species.

Centrodorsal low hemispherical, the bare polar area papillose, 1 mm. in diameter; cirrus sockets in a single irregular not especially crowded row.

Cirri moderately slender, XII, 20–21, 12 mm. long; first segment short, the following gradually increasing in length and becoming about one-third longer than broad on the fourth; next two similar; following slowly decreasing in length, the segments in the outer part of the cirri being about as long as broad; sixth and seventh and following segments with long sharp dorsal spines; opposing spine nearly as long as the diameter of the penultimate segment, slender, sharp, erect; terminal claw twice as long as the penultimate segment, strongly curved proximally, becoming straighter distally. The cirrus segments are somewhat constricted centrally with slightly expanded and overlapping distal ends.

Disk covered with rounded isolated flat plates, and thickly plated along the ambulacra and on the anal tube.

Radials short, about four times as broad as long, sometimes with a faintly marked row of small tubercles along the distal border; IBr_1 about as long as the radials, four times as broad as long, oblong; IBr_1 and $_2$ united by a pseudo-syzygy in which the outer part of the joint face for about one-half the distance from the periphery to the rim of the central canal is marked with radiating ridges, the space within this border being smooth and flat except for the low and narrow synarthrial longitudinal ridge; IBr_2 pentagonal, twice as broad as long.

Ten arms 50 mm. long; first two brachials subequal, slightly wedge-shaped, twice as broad as long exteriorly; third and fourth brachials (syzygial pair) slightly longer interiorly than exteriorly, twice as broad as the exterior length; next four brachials oblong, slightly over twice as broad as long, then becoming obliquely wedge-shaped, about as long as broad, after the proximal third of the arm less obliquely wedge-shaped, about as long as broad, and terminally slightly longer than broad; the brachials after the tenth have somewhat produced distal ends. Syzygies occur between the third and fourth brachials, again most commonly between the thirteenth and fourteenth, and distally at intervals of from six to ten (usually eight or nine) oblique muscular articulations.

P_1 8 mm. long, moderately stout basally, but tapering rapidly in the proximal half and becoming very slender and thread-like distally, with about twenty-five segments, the first about twice as broad as long, the following gradually increasing in length, becoming squarish on the fifth and following and slightly longer than broad terminally; the first three to five segments are slightly carinate and rounded-prismatic; P_2 about 10 mm. long, stouter than P_1 but similar to it, with about thirty segments; P_3 3.5 mm. long, small, weak, and slender, exceedingly slender in its distal half; P_4 similar, 3 mm. long; P_5 2 mm. long with ten segments not tapering so rapidly as the preceding, and therefore appearing somewhat stouter; following pinnules similar, soon increasing slowly in length and slenderness; distal pinnules very slender, 6 mm. long, with fifteen or sixteen segments.

The color is deep violet, the cirri white.

Type.—Cat. No. 27489, U.S.N.M., from station 5276.

My studies upon the origin and significance of the nonmuscular articulations in the crinoid arm ^a have shown that the occurrence of a true syzygy proximal to the syzygy between the third and fourth brachials of the free undivided arm is a very anomalous condition. Such a state of affairs has been supposed to exist in the comasterid genera *Comaster* and *Comatula*, and in the Zygometridæ. In the first two genera I have been able to prove that the supposed syzygies are in reality derived secondarily from the normal synarthries ^b and have nothing to do with true syzygies at all. I had never seen anything among the Zygometridæ which would warrant the statement that the syzygy found between the two elements of their IBr series is derived from a synarthry until the specimen just described came to hand. In this the primitive synarthry is in process of transformation into a pseudo-syzygy through the development of radiating ridges along the periphery of the joint face, which are apparently extending inward toward the central canal.

I now think that there can be no doubt that the "syzygy" between the two elements of the IBr series in the Zygometridæ is in reality nothing more than a remarkably perfect pseudo-syzygy derived secondarily from the synarthry, a condition called for by my interpretation of the brachial homologies as explained in previous papers.

^a Amer. Nat., vol. 43, 1909, pp. 577-587; Proc. U. S. Nat. Mus., vol. 35, 1908, pp. 113-131.

^b Proc. Biol. Soc. Washington, vol. 22, pp. 173, 174.

Genus CATOPTOMETRA.

CATOPTOMETRA OPHIURA, new species.

Centrodorsal thin-discoidal with a broad moderately concave polar area 5 mm. to 8 mm. in diameter marked in the center by a shallow rounded pit; cirrus sockets in two closely crowded irregular marginal rows.

Cirri XXVII, 15–18 (usually 17), 22 mm. long; first segment about twice as broad as long, second not quite so long as broad, third half again as long as the median diameter, fourth and fifth twice as long as the median diameter, the following gradually becoming very slightly shorter so that the terminal segments are half again as long as broad; dorsal and ventral edge of the longer proximal segments, especially the former, rather strongly concave, this feature gradually dying away distally; lateral edges of these longer proximal segments very strongly concave, this character gradually becoming less marked but persisting to the end of the cirrus; penultimate segment about one-third longer than broad; opposing spine terminal, small and inconspicuous; terminal claw half again as long as the penultimate segment, slender and slightly curved.

Radials barely visible in the angles of the calyx; IBr_1 very short and bandlike, oblong; IBr_2 triangular, nearly three times as broad as long; IBr_1 and $_2$ well separated laterally; $IIBr$ 4 (3+4); $IIBr_1$ interiorly united for the proximal half or two-thirds, diverging so as to make right angles with each other distally; $IIIBr$ (when present) 2 always developed interiorly in 1, 2, 2, 1 order; synarthrial tubercles sharp and prominent.

Twenty to twenty-seven arms 180 mm. long; first brachial wedge-shaped, about twice as broad as long exteriorly, interiorly united for about the proximal two-thirds; second brachial about the same size but more obliquely wedge-shaped; third and fourth brachials (syzygial pair) slightly longer interiorly than exteriorly, about twice as broad as the median length; following five brachials oblong or slightly wedge-shaped, two to three times as broad as long, then becoming triangular, nearly as long as broad, then triangular and as long as broad, and distally obliquely wedge-shaped, becoming terminally longer than broad; distal edges of the tenth and following brachials moderately overlapping and finely spinous. Syzygies occur between the third and fourth brachials, again between the nineteenth and twentieth to thirty-sixth and thirty-seventh (usually about the twenty-seventh and twenty-eighth) and distally at intervals of eight to sixteen (usually ten or eleven) oblique muscular articulations.

P_D small and slender, 6 mm. long, with twenty-five to thirty segments, most of which are about as long as broad; the second to the fifth bear strong dorsal projections; P_1 7 mm. to 8 mm. long, slender, the second to the fourth segments with dorsal projections which are

not so large as those on the basal segments of P_D ; P_2 resembling P_1 but 15 mm. long with forty to forty-two squarish segments, the first to the fourth with slight dorsal projections; P_3 similar, 12 mm. long; P_4 similar, 11 mm. long; P_5 similar, 11 mm. long; the following pinnules gradually decrease in length to 7 mm., then slowly increase to 10 mm. distally; the carination of the proximal segments of the lower pinnules becomes progressively less and less, disappearing entirely after P_{10} or P_{12} .

Color dull olive green, the disk ambulacra and the perisome of the pinnules dark brown.

Type.—Cat. No. 27490, U.S.N.M., from station 5356.

This species is nearest to *C. hartlaubi* of Japan, but the cirri are longer, much stouter, with more and shorter segments, which have strongly swollen articulations. The division series and arm bases lack the strongly everted and spinous distal edges so characteristic of those of *C. hartlaubi*.

Station 5356.—Four specimens, one with twenty, two with twenty-six, and one with twenty-seven arms.

Station 5414.—One small specimen with eleven arms about 90 mm. long.

Genus EUDIOCRINUS.

EUDIOCRINUS INDIVISUS (Semper).

Station 5356.—Five specimens, each with arms about 85 mm. long.

Family HIMEROMETRIDÆ.

Subfamily HIMEROMETRINÆ.

Genus AMPHIMETRA.

AMPHIMETRA MILBERTI (J. Müller).

Limborres Cave.—One specimen.

AMPHIMETRA VARIIPINNA (P. H. Carpenter).

Station 5358.—One specimen with eleven arms 150 mm. long and cirri XI, 34–41, 35 mm. to 37 mm. long. The cirri are rather more slender than usual, the processes on the segments of the proximal pinnules are less developed, and the general appearance is not so rugged as is commonly the case. The animal is probably not quite mature.

Station 5481.—One small specimen with twelve arms.

Genus HIMEROMETRA.

HIMEROMETRA MAGNIPINNA A. H. Clark.

Ulugan Bay, Palawan.—One magnificent specimen with forty-two arms 184 mm. long and cirri XXXIII, 29–35, 30 mm. long; the color is a uniform deep violet.

Genus CRASPEDOMETRA.

CRASPEDOMETRA ANCEPS (P. H. Carpenter).

Station 5355.—One small specimen with eighteen arms about 80 mm. long and cirri 20 mm. to 22 mm. long.

An examination of the *Challenger* types in London has shown me that Carpenter's *Antedon clemens* is the same thing as his *Antedon anceps* and as my *Craspedometra aliena*.

Subfamily STEPHANOMETRINÆ.

Genus STEPHANOMETRA.

STEPHANOMETRA CORONATA A. H. Clark.

Port Busin, Barias Island.—One fine specimen closely resembling the type in the Indian Museum at Calcutta; it has thirty-four arms about 150 mm. long; four of the post-radial series bear seven arms and one bears six; as in the type the division series omitted are always internal; the cirri are XVIII, 27–29, 26 mm. to 28 mm. long.

The color is dark purple.

This species was previously only known from "India."

Subfamily MARIAMETRINÆ.

SELENOMETRA, new genus.

Centrodorsal large, hemispherical, bearing numerous cirri which are long, moderately slender, with very numerous (45 or more) segments, of which the outer are short and bear sharp dorsal spines; radials long, their outer sides parallel to the dorso-ventral axis of the animal appearing when the animal is spread out as a short thick column; IBr and division series in close apposition and sharply flattened laterally; arms forty in number; proximal pinnules very slender, with about twenty segments, evenly tapering distally, slightly stiffened.

Genotype.—*Antedon finschii* Hartlaub, 1890.

SELENOMETRA VIRIDIS, new species.

Cirri XXXIII, 47–57, 30 mm. to 35 mm. long, rather slender; sharp dorsal spines are developed from the tenth or twelfth, which is a more or less marked transition segment, onward.

Calyx and arm bases as in *S. gracilipes*,^a but the division series and proximal ten brachials are sharply flattened laterally.

Forty arms 90 mm. long.

P₁ 10 mm. long, slender, with nineteen segments, which become twice as long as broad distally; P₂ and P₃ similar, 12 mm. long with twenty-one segments, slightly stiffer than P₁, and proportionately

^a *Himerometra gracilipes* A. H. Clark, *Smiths. Misc. Coll. (Quarterly Issue)*, vol. 52, 1908, p. 219.

stouter; P_4 9 mm. long with eighteen segments as slender as P_1 but slightly stiffer; P_5 7 mm. long, resembling P_4 ; P_6 5.5 mm. long resembling P_5 but less stiffened; P_7 and following pinnules 5 mm. long, the component segments slightly shorter than in the preceding pinnules; distal pinnules very slender, 7 mm. long.

The color is greenish yellow.

Type.—Cat. No. 27491, U.S.N.M., from station 5413.

Family PONTIOMETRIDÆ.

EPIMETRA, new genus.

Centrodorsal small, hemispherical, the dorsal pole convex.

Cirri long and rather stout, moderate in number, with between thirty and forty segments, the ninth and following short and strongly carinate dorsally with swollen distal ends; opposing spine V-shaped in dorsal view, crescentic in end view.

Structure of calyx and arms as in *Pontiometra*.

On the outer arms P_a is absent; on the inner arms P_a and P_1 are absent. The enlarged proximal pinnules are very slender, but much stiffened and not flagellate distally; on the outer arms P_2 is the longest; on the inner, P_b ; P_1 is shorter than P_2 ; P_3 is as long as P_1 , but resembles P_2 ; P_4 and the following pinnules are very short.

Genotype.—*Epimetra nympa*, new species.

EPIMETRA NYMPHA, new species.

Centrodorsal small, hemispherical, the dorsal pole convex, 1 mm. in diameter.

Cirri XIII (deficient in two interradii) 37–39, 12 mm. long; first segment short, the following gradually increasing in length and becoming about as long as broad on the fifth; following four to six slightly longer than broad, then gradually decreasing in length, the segments in the outer half of the cirri being nearly twice as broad as long; the eighth segment is a transition segment; the following segments have the distal dorsal edge slightly thickened and produced and the dorsal surface developing a low narrow median keel, becoming more prominent in the outer part of the cirrus, so that the dorsal profile of the outer part of the cirri is scalloped; opposing spine in dorsal view a thick V-shaped production of the distal half of the penultimate segment; the two limbs of the V are thick distally, tapering to a fine point at the apex; in end view this opposing spine is seen as a strong, high crescent.

Radials strongly produced interradially, separating the bases of the IBr_1 for a distance equal to about one-half of their dorsal transverse diameter; IBr , $IIBr$, and $IIIBr$ resembling the corresponding series in *Pontiometra andersoni*, but the component segments are somewhat longer and the synarthrial tubercles are more pronounced.

Thirty-nine arms, about 50 mm. long, resembling those of *Pontio-metra andersoni*, but the brachials are slightly constricted centrally and have rather prominent ends.

On the outer arms P_a is absent; on the inner arms P_a and usually also P_1 are absent.

P_1 on the outer arms 6 mm. long with twelve segments, exceedingly slender, the component segments not quite so long as those of the next pinnule; P_2 8.5 mm. long with ten segments, resembling P_1 , but slightly larger and stouter and much stiffer; P_3 6 mm. long, stiffer than P_1 , with nine segments, resembling those of P_2 ; P_4 4.3 mm. long, very slender, with eight segments, all but the first two of which are greatly elongated; following pinnules gradually increasing in length, the distal pinnules being 7 mm. long with twelve segments.

P_b on the inner arms is 9 mm. long with eleven segments, the first not so long as broad, the second half again as long as broad, the third three times as long as broad, and the following greatly elongated with swollen articulations; the last two or three have long and very slender spines upon their distal ends; the terminal segment, as usual, is short; the pinnule is exceedingly slender, stiff, but not flagellate.

Type.—Cat. No. 27492, U.S.N.M., from station 5356.

Family COLOBOMETRIDÆ.

Genus CENOMETRA.

CENOMETRA BELLA (Hartlaub).

Station 5401.—One specimen with twenty-three arms 120 mm. long; the cirri have 36–39 segments.

Genus COLOBOMETRA.

COLOBOMETRA DISCOLOR A. H. Clark.

Station 5355.—One small specimen with arms 60 mm. long.

Station 5356.—Two specimens; one has the arms 95 mm. long and cirri XIV, 30–40, 25 mm. long; the other is smaller.

These three specimens were compared directly with the type in the Indian Museum, Calcutta, and no differences were found.

Genus CYLLOMETRA.

CYLLOMETRA MANCA (P. H. Carpenter).

Station 5356.—Three small specimens; one has twenty-three arms 45 mm. long, and is entirely deep purple in color; another has fifteen arms about 40 mm. long; the third has ten arms 40 mm. long and cirri with 26–28 segments, 12 mm. long.

Station 5369.—One specimen.

Genus OLIGOMETRA.

OLIGOMETRA JAPONICA (Hartlaub).

Station 5356.—Two specimens.

OLIGOMETRA GRACILICIRRA, var. ORNATA, new variety.

In general similar to typical *O. gracilicirra*; but the broad IBr and first two brachials, instead of just coming into apposition laterally and showing only a trace of lateral flattening, are sharply flattened against their neighbors, their outer edges along the line of union being strongly everted and strongly denticulate; the radials bear an abrupt rounded dorso-ventrally elongate median tubercle; the IBr series have an abrupt more or less tuberculated median ridge which is continued on to the arm bases, becoming less noticeable as the brachials become triangular, but traceable to the distal portion of the arm; there is only a slight suggestion of this in typical *O. gracilicirra*. The color pattern is as in the specimens of *O. gracilicirra* at hand, but the color is much deeper.

Type.—Cat. No. 27493, U.S.N.M., from station 5355.

Two additional specimens were secured at this station.

Station 5356.—Two similar specimens.

Family TROPIOMETRIDÆ.

Genus CALOMETRA.

CALOMETRA ALECTO, new species.

This new form belongs to that group of the genus including *Calometra multicolor*, *C. acanthaster*, and *C. spinossima*.

Centrodorsal discoidal, moderately thick, the bare polar area flat, 4 mm. in diameter; cirrus sockets in a single slightly irregular marginal row.

Cirri IX–XV, 39–46, 25 mm. to 30 mm. long, resembling those of *S. spinossima* but somewhat more slender, especially distally; there is no ventral carination as in *C. acanthaster*. The first segment is very short, the following gradually increasing in length to the fifth, which is nearly or quite as long as broad; following to the twelfth similar, then gradually decreasing in length, those in the terminal third of the cirri being twice as broad as long; after the fifth or sixth the distal dorsal edge becomes prominent, distally gradually narrowing and becoming higher and moving anteriorly, the dorsal surface of the segments at the same time becoming strongly carinate so that the short distal segments possess prominent, though small and broadly rounded, dorsal spines which scarcely reach in height one-quarter of the lateral diameter of the segments which bear them; in the longer proximal segments there is more or less eversion of the

ventral distal edge. The cirri are moderately stout basally, but taper slightly, becoming rather slender distally.

Disk, calyx, and arm bases as in *C. multicolor*; the division series and first two brachials have a slight rounded median carination.

Fifteen to twenty arms 60 mm. to 70 mm. long, resembling those of *C. multicolor*; the brachials have moderately produced distal dorsal ends.

P_1 7 mm. long with twenty-five segments, slender and weak, with the first segment greatly enlarged; P_2 stiff and spinelike, 10 mm. long; P_3 similar, 12 mm. long; P_4 similar, 10 mm. long; P_5 9 mm. long; P_6 8 mm. long; P_7 and following pinnules 6 mm. long; distal pinnules 8 mm. long.

Type.—Cat. No. 27494, U.S.N.M., from station 5414.

There were also obtained at this station eighteen additional specimens, two with thirteen arms, one with fifteen, two with sixteen, three with seventeen, one with eighteen, three with nineteen, and five with twenty; one of the specimens was small and much mutilated; the two thirteen-armed specimens are young.

Station 5356.—One specimen with nineteen arms.

Station 5413.—Two specimens, one with seventeen the other with eighteen arms.

CALOMETRA DISCOIDEA (P. H. Carpenter).

Station 5577.—One specimen with ten arms 110 mm. long and cirri XVIII, 43–49, 27 mm. long.

This species is easily distinguished from *Calometra callista* by its longer and stouter cirri, which have much longer segments proximally. The radials are produced interradially into a narrow process which entirely separates the IBr_1 ; the IBr_1 and $_2$ have irregular thin and broad lateral extensions which are just in apposition beyond the interradiial processes of the radials, thus forming, with the latter, a complete interradiial plating. The disk is covered with a solid pavement of small subequal plates which become elongated on the anal tube. There are five small but well formed orals, resembling those of *Hyocrinus*.

Genus PTEROMETRA.

PTEROMETRA TRICHOPODA (A. H. Clark).

Station 5356.—One small specimen with sixteen arms.

Station 5413.—Two specimens; one has twenty arms 75 mm. long and cirri 80 mm. long, the other has twenty-one arms 70 mm. long and cirri 75 mm. long.

Station 5414.—Sixteen specimens; one has thirty arms 60 mm. long and cirri 50 mm. long, with 70–87 segments; another has twenty arms 73 mm. long and cirri 77 mm. long, the longest with 100 seg-

ments; the cirri of this specimen are rather stouter than those of the preceding; another has twenty arms 60 mm. long and cirri 60 mm. long; another has twenty-one arms 65 mm. long, the longest cirrus 75 mm. long, with 106 segments; another has nineteen arms; another has twenty-two arms 75 mm. long, the longest cirrus 80 mm. long; another has twenty-three arms 65 mm. long and cirri 70 mm. long; another has twenty-nine arms; another has twenty arms; one IIBr series is lacking, but a IIIBr series is developed on one ray; seven specimens have from twenty to twenty-five arms.

Station 5593.—One specimen with twenty-three arms and the longest cirrus 80 mm. in length, with 108 segments.

As a general rule the cirri average about 5 mm. shorter than the arms, though they are often the same length and may be even longer.

IIIBr series are always external in position (2, 1, 1, 2) as in all the Tropiometridæ in which they occur.

Genus ASTEROMETRA.

ASTEROMETRA MAGNIPEDA, new species.

Centrodorsal columnar, 5 mm. high and 6 mm. in diameter at the base, the dorsal pole elevated into a high truncated conical process about 3 mm. high, surmounted by a rosette of five small radial tubercles; cirrus sockets in ten columns of three each, the two columns in each radial area interiorly separated by about twice the distance separating the columns of adjacent areas.

Cirri XXX, 109–122, 100 mm. to 118 mm. long; first segment short, the following gradually increasing in length and becoming about as long as broad on the sixth; following segments similar or slightly longer (rarely so much as half again as long as broad), in the distal third of the cirrus very slowly becoming shorter, in the terminal portion being somewhat over twice as broad as long; beyond the proximal half of the cirri the segments very slowly become carinate and develop a projecting distal dorsal edge which is centrally elevated into a small spine; this slowly increases in height, involving more and more of the dorsal surface of the segment until in the very short terminal segments a high carinate spine is found reaching nearly one-half the lateral diameter of the segments in height, resembling the same structure found in the other species of the genus; last few segments rapidly tapering as in related species; a more or less marked transition segment occurs between the sixteenth and twenty-second (usually between the eighteenth and twentieth); ventral distal edge of the proximal segments slightly everted.

Twenty arms 90 mm. long resembling, with the IIBr series, those of *Asterometra macropoda*, though somewhat more slender basally; the dorsal surface of the division series and lower brachials is evenly and broadly rounded.

P_1 8 mm. long, small, slender, and evenly tapering, stiff, with sixteen segments; P_2 13 mm. long, stouter than P_1 with seventeen segments, the outer with produced and spinous distal ends; P_3 15 mm. long, with sixteen segments, slightly stouter than P_2 ; P_4 16 mm. long, resembling P_3 ; P_5 14 mm. long; P_7 13 mm. long; following pinnules similar, becoming gradually more slender distally and increasing in length to 14 mm.; the terminal four or five pinnulars have no ambulacral structures and are abruptly smaller and more slender than those preceding, with very spinous distal ends.

The color is brownish yellow.

Type.—Cat. No. 27495, U.S.N.M., from station 5413.

Another specimen was secured at this station which has twenty arms 90 mm. to 95 mm. long and cirri 100 mm. to 110 mm. long, with 99–105 segments; the longer cirri, however, are broken at the tip.

Station 5414.—Nine specimens; one has twenty-one arms 95 mm. long, cirri XXV, 99–112, 90 mm. to 105 mm. long; the IIIBr series is developed externally; another has twenty arms 100 mm. long, the cirri 95 mm. to 105 mm. in length; another has twenty arms 95 mm. long and cirri 90 mm. to 95 mm. long; of the remaining specimens one (small) has thirteen arms, one (small) sixteen, one eighteen, two nineteen, and one twenty.

This species is most nearly related to *Asterometra pulcherrima*,^a but it differs markedly in the much greater development of the cirri.

ASTEROMETRA CRISTATA, new species.

In general similar to *Asterometra longicirra* from the Ki Islands, and to *A. mirifica* from the Sahul Bank.

The IBr series and first two brachials bear a narrow, sharp, very prominent median keel of uniform height, which is not nearly so high nor so sharp as that of *A. mirifica*. In this latter the keels are seen in profile to be rather strongly convex along the apex, giving a characteristic scalloped appearance to the lower part of the animal; in the present species the crest is straight, so that the profile view of the animal is not altered.

The cirri in the type are XX, 77–86, 60 mm. to 65 mm. long, rather short, moderately stout, especially basally, ventrally rounded-carinate in the proximal half, the distal ventral edge of the short proximal segments being rather strongly produced, this character gradually dying away as the segments become longer.

The ten arms are 100 mm. long, proportionately more slender than in the other related ten-armed species.

The centrodorsal is conical, with the cirrus sockets in ten columns close together, two, more rarely three, sockets to a column.

Type.—Cat. No. 27496, U.S.N.M., from station 5483.

^a *Ptilometra pulcherrima* A. H. Clark, Proc. U. S. Nat. Mus., vol. 36, 1909, p. 400.

Station 5482.—Five specimens; one has ten arms 90 mm. long and cirri 77–82, 55 mm. to 60 mm. long; another has ten arms 100 mm. long and cirri 82–107, 75 mm. to 80 mm. long, and a third is similar; one specimen has eleven arms 100 mm. long and cirri 85–94, 60 mm. to 70 mm. long; the single IIBr series is 2 as in *A. macropoda*; the last specimen also has eleven arms, one of the IBr axillaries bearing three equal arms instead of the usual two.

Family THALASSOMETRIDÆ.

Subfamily THALASSOMETRINÆ.

Genus COSMIOMETRA.

COSMIOMETRA PHILIPPINENSIS, new species.

Centrodorsal conical, about 4 mm. broad at the base and 4 mm. long; cirrus sockets arranged in ten columns, two to each radial area, two or three sockets to a column; the columns of each radial area are separated in the mid-radial line by a broad, bare, more or less finely spinous area about equal in width to a column of cirrus sockets; outwardly the columns of cirrus sockets are in close apposition with those of the adjacent radial areas.

Cirri stout, XX, 45–54 (the longer 49–54), 35 mm. to 42 mm. long; first segment short, the following gradually increasing in length to the fourth, which is about twice as broad as long, and the fifth, which is about half again as broad as long; sixth a transition segment, half again to twice as long as broad; following segments gradually decreasing in length, becoming squarish about the eleventh and twice as broad as long after the fifteenth; after the eighth or ninth the distal dorsal edge of the segments becomes slowly prominent so that the segments after the fifteenth or sixteenth are provided with a high and prominent dorsal spine as in the other species of the genus.

Ends of the basal rays visible as small but prominent tubercles in the angles of the calyx; radials concealed, or just visible in the mid-radial line; IBr₁ more or less crescentic, convex proximally, about four times as broad as long, with finely serrate edges and with the lateral thirds of the dorsal surface finely spinous; IBr₂ broadly pentagonal or rhombic, with blunted lateral angles, twice as broad as long, the edges finely serrate, the dorsolateral edge with a few small spines; division series and first brachial sharply flattened laterally; IIBr 2.

Nineteen arms 130 mm. long; first brachial slightly wedge-shaped, about twice as broad as long exteriorly; second brachial similar, but nearly twice as large; third and fourth brachials (syzygial pair) oblong, half again as broad as long; following six brachials approximately oblong, about two and one-half times as broad as long, then

becoming very obliquely wedge-shaped, half again as broad as long, toward the middle of the arm as long as broad, becoming distally less obliquely wedge-shaped, and terminally longer than broad. The arms increase slightly in diameter to the twelfth or fourteenth brachials, then slowly taper distally; the proximal third of the arm is very deep and strongly compressed laterally; the outer two-thirds is rather sharply rounded dorsally. After the oblong proximal brachials, the distal ends of the brachials begin to project as a serrate overlap which in the outer half of the arms becomes very pronounced and is accompanied by a fine spinosity of the dorsal (but not lateral) surface of the ossicles as in *C. komachi*.

The pinnules are essentially as in *C. komachi*.

The color is bright yellow.

Type.—Cat. No. 27497, U.S.N.M., from station 5523.

This new species is most closely related to *C. komachi* from southern Japan, but the division series and oblong lower brachials are smooth, without the broadly everted and roughened edges and the rounded median linear tubercles of the latter, and the bare mid-radial areas on the centrodorsal are much broader.

Both these species are related to *C. woodmasoni* which, however, appears to differ in the greater compression of the division series and consequent apparent narrowness of the lower part of the animal, and in the shortness of its cirri, which are said to have 35–45 segments, though figured with 35 (fig. 1) and 50 (figs. 2, 3).

Station 5424.—Three specimens, two with nineteen and one with twenty arms 100 mm. to 110 mm. long and cirri 35 mm. to 40 mm. long. These are somewhat smaller and more delicate than the type specimen described, with slightly more projecting edges to the division series and proximal brachials.

Genus CROTALOMETRA.

CROTALOMETRA PROPINQUA, new species.

Centrodorsal moderate in size, conical, the sides slightly convex, 5.5 mm. broad at the base and 4.5 mm. high, to 4.5 mm. broad at the base and 3.5 mm. high, the tip somewhat truncated; cirrus sockets in ten columns, two or three to a column, the columns slightly separated in the mid-radial line, in close apposition interradially.

Cirri XX, 59–64, 45 mm. to 55 mm. long, moderately stout (though not nearly so stout as those of *C. eupedata*); first three segments short, becoming as long as broad on the fourth or fifth; fifth–seventh (usually the sixth) a transition segment, half again as long as broad; following segments gradually decreasing in length, becoming about as long as broad on the fourteenth–sixteenth, and distally twice as broad as long; shortly after the transition segment the distal dorsal edge of the segments begins to become produced, rising up to

form a sort of gable, which leans somewhat inward, with serrate sides, and a blunt tubercle at the apex; but the dorsal surface of the segments does not become generally carinate, as is usually the case.

Ends of the basal rays visible or prominent, though small, tubercles in the angles of the calyx; radials just visible beyond the edge of the centrodorsal, more or less covered with fine spines and with a finely serrate distal border; IBr_1 very short, about four times as broad as long, convex proximally, concave distally; IBr_2 rhombic with the sides concave, twice as broad as long, the lateral edges shorter than those of the IBr_1 ; elements of the IBr series and first two brachials with somewhat everted, finely spinous edges, sometimes with scattered fine spines on the dorsal surface and a thick development of fine spines along the lateral margins, which are somewhat produced.

Ten arms 130 mm. long; first brachial short, twice as broad as long exteriorly, incised somewhat on its distal margin; the synarthrial tubercles are moderately prominent, broadly rounded; second brachial larger, with a rounded posterior process incising the first; third and fourth brachials (syzygial pair) one-third to one-half again as broad as long, oblong; next four brachials oblong, about two and one-half times as broad as long, the following becoming obliquely wedge-shaped and then triangular, as long as broad, and wedge-shaped again distally; the earlier brachials with everted and finely spinous distal ends; fourth and following with the dorsal (but not the lateral) surface thickly covered with fine spines, which on the outer brachials become somewhat coarser and are directed anteriorly; proximally as the brachials become wedge shaped the distal edge begins to overlap and the proximal to lose its eversion so that the later brachials assume strongly produced and very spinous distal ends.

In *C. eupedata* the second and following brachials are thickly covered with minute spines, but they are evenly distributed over the entire exposed surface, lateral as well as dorsal, and they are neither so large nor so long as in this species.

The color is yellow.

Type.—Cat. No. 27498, U.S.N.M., from station 5424.

A second similar specimen was secured at this station.

Station 5274.—One specimen, somewhat larger than the two preceding, the arms being about 150 mm. in length.

Station 5445.—One specimen, resembling the type.

CROTALOMETRA INFELIX, new species.

Centrodorsal low-conical, with the apex abruptly prolonged; cirrus sockets in ten closely crowded columns.

Cirri XX, 38–44, 25 mm. to 30 mm. long; first segment short, the following gradually increasing in length, becoming about as long as broad on the fifth and half again as long as broad on the seventh; following segments gradually decreasing in length becom-

ing about as long as broad on the eleventh, and half again to twice as broad as long distally; eighth and following with produced distal dorsal edges which soon become prominent dorsal spines.

Disk completely plated.

Ends of the basal rays visible in the angles of the calyx as dorso-ventrally elongate tubercles; radials short, about four times as broad as long, with a prominent median tubercle; IBr₁ decreasing slightly in width distally, about twice as broad distally as long in the median line; it bears a low broadly rounded median carination, most prominent posteriorly; IBr₂ rhombic, half again as broad as long, the proximal two-thirds of the median dorsal line raised into a low broad tubercle; IIBr 4 (3 + 4).

Thirteen arms 90 mm. long; after the proximal third the brachials gradually develop produced and overlapping spinous distal edges, at the same time becoming laterally compressed; after the proximal half this production of the distal edge becomes very prominent, especially in the median line.

Type.—Cat. No. 27499, U.S.N.M., from station 5317.

This species is nearest to *C. sentifera*; but the centrodorsal is proportionately much smaller and bears closely crowded columns of cirrus sockets without bare mid-radial areas, the edges of the elements of the IBr series are smooth instead of finely dentate, the IBr₁ has a distinct, though low, rounded median carination, and the distal overlap of the brachials, though very prominent, is not produced into the long overlapping spine characteristic of *C. sentifera*.

The type of *C. infelix*, however, is a small specimen; larger specimens may prove to approach *C. sentifera*, though it seems most probable that the two forms are quite distinct.

Genus THALASSOMETRA.

THALASSOMETRA ANNANDALEI (A. H. Clark).

This species was originally described in the genus *Crotalometra*, but I believe that it had better be referred to the genus *Thalassometra*, in which it would occupy a position near *T. gigantea*.

Station 5116.—A small thalassometrid with eleven arms 60 mm. long from this station I originally referred to *Crotalometra eupedata*,^a though with considerable hesitation. At that time the present species was not known. Comparison with the specimens at hand shows that it is without doubt an example of *Thalassometra annandalei*.

Station 5280.—One specimen with twenty-one arms 130 mm. long and cirri 50 mm. to 60 mm. long; there are four IIBr 2 series; two of these bear (externally) IIIIBr 4 (3 + 4) series.

^aProc. U. S. Nat. Mus., vol. 36, 1909, p. 406.

Station 5367.—Five specimens; one has twenty arms 85 mm. long and cirri 40 mm. to 47 mm. long; all the IIBr series are 4 (3+4); another has nineteen arms 115 mm. long and cirri 40 mm. to 45 mm. long; seven of the IIBr series are 4 (3+4), two are 2; another has twenty-three arms 110 mm. long, the cirri being 40 mm. to 45 mm. long; the ten IIBr series and the three IIIIBr series are 4 (3+4); another has nineteen arms; three of the IIBr series are 2, six are 4 (3+4); the fifth specimen has twenty arms, the ten IIBr series being all 4 (3+4).

Station 5503.—Three specimens with twenty arms 120 mm. long; twenty arms 115 mm. long; and nineteen arms 130 mm. long, respectively.

Station 5504.—Two specimens.

Station 5506.—Two specimens, one with nineteen arms 90 mm. long, the other small, with fifteen arms.

Station 5536.—One specimen with twenty-two arms 160 mm. long and cirri 40 mm. to 50 mm. long; one of the IIBr series is 2, the remaining eight 4 (3+4); the axillary of one of the IIBr 2 series bears on its inner face another axillary and on its outer the first element of a IIIIBr 2 series which is supported equally by the IIBr axillary and by the outer side of the IIIIBr axillary.

All these specimens are somewhat smaller and more slender than the type in the Indian Museum, with which they were directly compared. The division series and lowest brachials are usually also slightly more spinous, and thus more nearly like the brachials just succeeding; there is, however, considerable variation in this character.

THALASSOMETRA HIRSUTA, new species.

Centrodorsal low conical, the dorsal pole finely papillose; cirrus sockets arranged in ten columns of two or three each, the two columns of each radial area being slightly separated proximally by a narrowly linear or wedge-shaped papillose area.

Cirri slender, XV–XXV, 48–66 (usually 54–66), 30 mm. to 50 mm. long; first segment short, the following increasing in length and becoming squarish or slightly longer than broad on the fourth; fifth or sixth a transition segment, about three times as long as broad; following segment nearly as long, the succeeding gradually decreasing in length, those in the distal part of the cirrus being somewhat broader than long; after the transition segment the distal dorsal edge slowly becomes produced, the short outer segments bearing rather low blunt spines.

Radials concealed; IBr₁ very narrow, crescentic, the edges all around strongly everted and coarsely spinous, with a coarsely spinous median carination and a few coarse spines scattered over the dorsal

surface; IBr₂ rhombic, twice as broad as long, the edges all around strongly everted and coarsely spinous, with a coarsely spinous median carination in the proximal two-thirds, and with coarse spines scattered irregularly over the dorsal surface.

Ten arms; first brachial short, slightly wedge-shaped, three or four times as broad as long exteriorly, the edges all around strongly everted and coarsely spinous, the dorsal surface more or less covered with rather long spines, and with a coarsely spinous median keel; second brachial slightly larger and more obliquely wedge-shaped; third and fourth brachials (syzygial pair) oblong, half again to nearly twice as broad as long; following four brachials approximately oblong, twice as broad as long, then becoming triangular, as long as broad, and further out wedge-shaped, somewhat longer than broad, and elongate terminally; the third-eighth brachials have strongly everted and spinous ends, and have the dorsal surface very thickly covered with rather long fine spines; the median carination seen on the elements of the IBr series and on the first two brachials may be faintly suggested on the third and fourth, but extends no farther; as the brachials become triangular the dorsal spinosity becomes shorter and finer and less evident, the proximal ends of the brachials become less everted and the distal more so, this distal eversion leaning gradually forward, becoming a spinous overlap which is fairly prominent distally; at the same time the dorsal surface of the brachials becomes marked by numerous fine sharp longitudinal ridges, most prominent distally; in the outer part of the arm the distal part of these ridges breaks up into numerous thickly set anteriorly directed spines.

Type.—Cat. No. 27500, U.S.N.M., from station 5445.

Three other specimens were secured at this station.

Station 5275.—One specimen.

Station 5474.—One specimen.

This form is nearest to *Thalassometra attenuata*, but it is stouter than that species, with shorter and somewhat stouter cirri, which have usually fewer segments. It differs greatly, however, in the great development of spines on the division series and arm bases, these parts in *T. attenuata* being comparatively smooth.

Genus STENOMETRA.

STENOMETRA CRISTATA, new species.

This new species is nearest to *Stenometra dorsata* from southern Japan, but is a smaller and more slender form; the centrodorsal is proportionately smaller, more conical, and less columnar, with a rounded conical tip, finely papillose; the arms are 85 mm. long in the type, and the cirri are about 40 mm. long; the fifth or sixth cirrus segment, which is the longest, is twice as long as broad, or even somewhat

longer, this being but little longer than broad in *S. dorsata*; the carination of the elements of the IBr series and the lower brachials is not quite so high as in *S. dorsata* and is more regular, with a more even crest; it is irregular and serrate in profile in *S. dorsata*.

S. quinquecostata resembles *S. dorsata* in having short cirrus segments, but it differs in having a considerably larger number.

Type.—Cat. No. 27501, U.S.N.M., from station 5275.

The type has twenty arms; at the same station four smaller specimens were secured, with eighteen, seventeen, fourteen, and thirteen arms, the two last being immature.

Genus PARAMETRA.

PARAMETRA COMPRESSA (P. H. Carpenter).

Station 5279.—Two specimens.

Station 5325.—One specimen with twenty arms 170 mm. long.

Station 5367.—Five specimens; one has twelve, one thirteen, one sixteen, and two nineteen arms, in the largest 115 mm. long.

Station 5411.—One specimen with fourteen arms 145 mm. long.

Station 5519.—Two specimens with arms about 160 mm. long.

Station 5523.—One specimen.

Station 5536.—Six specimens, all with arms about 150 mm. long.

In this species the sides of the division series and lower brachials are more or less covered with fine tubercles, and each segment bears a narrow and low, but distinct, carination.

PARAMETRA ORION (A. H. Clark).

Between Pracas Reef and Formosa.—Three specimens, all bright yellow.

This species has the division series invariably smooth laterally and without any median carination. It possesses rather fewer arms than *P. compressa* and does not reach so large a size.

Subfamily CHARITOMETRINÆ.

Genus PACHYLOMETRA.

PACHYLOMETRA SEPTENTRIONALIS, new species.

A much greater familiarity with the numerous species of this very difficult genus, and especially the acquisition of a fine adult unquestionably referable to *Pachylometra distincta*, has shown me that I was in error in referring to that species the Japanese *Pachylometra* found by Mr. Alan Owston in Sagami Bay.^a In reality it represents a well-marked new species, which may be described as follows:

Centrodorsal very rounded, conical, broader than high, the bare polar area very small, 1 mm. in diameter, surrounded by five small radial tubercles; cirrus sockets arranged in ten closely crowded columns of two or three each.

^aProc. U. S. Nat. Mus., vol. 34, p. 312.

Cirri XX, 19–23, about 35 mm. long, very stout, in lateral view increasing considerably in diameter in the outer portion; first segment short, twice as broad as long, the following gradually increasing in length to the fourth, which is about as broad as long; following similar, the terminal becoming slightly broader than long; the penultimate segment is of less diameter than those immediately preceding, half again as long as broad; on the fourth or fifth segment the dorsal surface becomes rounded carinate, this carination slowly becoming higher and sharper, on the distal ten or twelve standing out as a high narrow sharp keel, the distal apex of which, in lateral view, is seen to be parallel to the axes of the segments; the opposing spine is small, but prominent, terminal in position.

Ends of the basal rays very prominent in the interradian angles; radials concealed; IBr_1 very short, crescentic, the lateral ends thickened and more or less everted, the proximal edge thickened and more or less tubercular or crenulate; a rather high, strongly rounded, dorsoventrally elongate tubercle occupies the median dorsal line; IBr_2 triangular, twice as broad as long, with a high median tubercle resembling that on the IBr_1 , the anterior (distal) portion of which bends to one side or the other, reaching almost or quite to the base of the $IIBr_1$; nine of the $IIBr$ series 4 (3+4), one 2, strongly and evenly convex dorsally; the two distal components are slightly separated interradianly by the carinate basal segments of P_D ; the ossicles of the $IIBr$ series bear rounded median tubercles similar to those on the IBr series, but somewhat less high; $IIIBr$ 2 (1+2), developed internally in 1, 2, 2, 1 order; two $IVBr$ 2 (1+2) series are present, one internal in reference to the preceding $IIIBr$ series, the other internal in reference to the preceding $IIBr$ series. The lower part of the animal is broad and stout and broadly rounded, so that the profile resembles in general that of the larger species of *Crinometra*.

Thirty-three arms 130 mm. long; the proximal oblong brachials have a slight trace of a low median tubercle; the outer brachials overlap slightly.

Type.—Cat. No. 27502, U.S.N.M., from southern Japan, the original label reading "Sagami Bay."

PACHYLOMETRA DISTINCTA (P. H. Carpenter).

Station 5510.—Four specimens; one has twenty-one arms 130 mm. long and cirri 20 mm. to 25 mm. long; another has twenty-nine arms, the $IIIBr$ series being 2 (1+2), internally developed; the third has twenty-four arms.

Station 5536.—One fine specimen with twenty-three arms 160 mm. long and cirri XXVI, 19–24, 23 mm. to 25 mm. long; all the $IIBr$ series are 4 (3+4); the three $IIIBr$ series are 2 (1+2), developed internally. The genital pinnules bear eggs.

The most striking characteristic of this species is its slenderness, especially the slenderness of the cirri, the long proximal segments of which are twice as long as broad.

PACHYLOMETRA LUNA, new species.

Centrodorsal as in *P. investigatoris*, but proportionately shorter; the cirrus sockets are arranged in ten columns of two or three each.

Cirri XXV, 23–25, 30 mm. to 40 mm. long, stout, resembling those of *P. investigatoris*.

Division series and arm bases essentially as in *P. investigatoris*; but the basal rays are much larger, rhombic, entirely concealing the radials in the interradial angles of the calyx; the division series and arm bases make a slightly greater angle with the dorso-ventral axis than in *P. investigatoris*, though in general the shape and proportions are the same; the division series are more convex dorsally than those of *P. investigatoris*, and the center of each in the median dorsal line rises into a broadly rounded tubercle instead of being obscurely carinate, as in *P. investigatoris*; similarly, indistinct broad tubercles occur on the oblong proximal brachials; the interradial angles are slightly more deeply excavated than are those of *P. investigatoris*. All the IIBr series are 4 (3+4) and all the IIIBr series are 2 (1+2), all but a single one of the latter being developed internally.

The twenty-nine arms of the type are 150 mm. long.

Type.—Cat. No. 27503, U.S.N.M., from station 5325.

PACHYLOMETRA SELENE, new species.

This new species is most closely related to *P. investigatoris* and *P. luna*.

Centrodorsal resembling that of *P. investigatoris*.

Cirri XXX, 17–19, 25 mm. to 30 mm. long, much shorter and with fewer segments than those of the two species mentioned; the segments in the outer half have rather strongly produced distal dorsal edges, which bear a rounded tubercle in the median line, so that the dorsal profile of the cirri is strongly serrate.

The division series and arm bases diverge, as in *P. investigatoris*, and are only slightly convex dorsally, not so much so even as in that species; each ossicle is smooth and even dorsally, but bears in its center a very prominent high rounded tubercle; these tubercles gradually become obsolete after the proximal quarter of the arms, but may be traced as far as the beginning of the distal half; two of the IIBr series are 4 (3+4) and two 2; there are no IIIBr series present.

The fourteen arms are 205 mm. long.

Type.—Cat. No. 27504, U.S.N.M., from station 5523.

Another specimen was taken at this station which has twenty arms 195 mm. long; nine IIBr 4 (3+4) and one IIBr 2 series are

present; the cirri are XXX, 17–21 (usually 18–19); the tubercles on the division series and lower brachials are not quite so prominent as in the type.

PACHYLOMETRA SMITHI (A. H. Clark).

Station 5282.—Three specimens; one has twenty-five arms 150 mm. long; another has thirty arms 140 mm. long, one IIBr series dividing both internally and externally and another not dividing at all; the third has thirty-three arms 110 mm. long, three of the (internally developed) IIIBr series bearing on the innermost side IVBr series of 2 (1+2).

Station 5348.—Twenty-two specimens, medium sized or small, with from nineteen to twenty-two arms, in the larger from 125 mm. to 135 mm. in length.

In the original description of this species^a the arm length is given as "60 mm.;" this is an error for 160 mm.

PACHYLOMETRA PATULA (P. H. Carpenter).

Station 5356.—Three specimens; one has fourteen arms about 170 mm. long and cirri XXII, 19–22, about 30 mm. long; the opposing spine is single, large and prominent; another has sixteen arms about 170 mm. long and cirri XX, 18–20, 30–33 mm. long, the opposing spine large, and prominent, usually forked at the tip; the third has twenty arms, the cirri XXV, 17–22, 30 mm. to 37 mm. long; the opposing spine is single.

PACHYLOMETRA FLEXILIS (P. H. Carpenter).

In the original description of this species^b the spread is given as "55 cm.;" this is an error for 35 cm.

Genus *GLYPTOMETRA*.

GLYPTOMETRA TUBEROSA (P. H. Carpenter).

Station 5367.—One specimen with eighteen arms; six of the IIBr series are 4 (3+4), and one is 2, the last bearing (externally) a IIIBr 4 (3+4) series.

Station 5406.—One specimen with twelve arms resembling the preceding, but the dorsal carination of the arm bases is slightly more prominent; the two IIBr series are 2.

Station 5431.—Twenty-two specimens; seventeen of these are ten armed, the arms being usually between 100 mm. and 115 mm. in length; the arms of the largest are 140 mm. long; three are eleven armed, the IIBr series being 2; one is twelve armed, the two IIBr series being 2; the last is a large six-rayed specimen.

^a *Charitometra smithi* A. H. Clark, *Smiths. Misc. Coll. (Quarterly Issue)*, vol. 52, pt. 2, p. 227 (229).

^b *Challenger Reports*, vol. 26, Zoology, p. 218.

Station 5510.—Two specimens, each with ten arms 100 mm. long.

Station 5536.—Two specimens; one has ten arms 125 mm. long; the other is of the same size, but has twelve arms, the two IIBr series being 2.

Station 5537.—Two nearly perfect specimens, both with arms 140 mm. long; both have regenerating disks; one has twelve arms, both IIBr series being 2; the other has eleven arms, two IIBr 2 series being present, but one post-radial series not dividing at all, the IBr₂ merely bearing a pinnule instead of being axillary.

Genus CHLOROMETRA.

CHLOROMETRA ROBUSTA, new species.

Centrodorsal long, conical, about 6 mm. wide at the base and 6 mm. high, the cirrus sockets confined to the mid-radial region, as in *C. aculeata*, where they are arranged in two very closely crowded converging alternating columns, which merge and become a single column distally; four or five cirrus sockets in each radial area.

Cirri stout and very long, XX–XXV, the peripheral 26–28, 55 mm. to 60 mm. long, becoming apically 21, 35 mm. to 40 mm. long; first segment short, the following increasing in length, becoming approximately as long as broad on the sixth, and from the eighth onward about twice as long as broad; distal dorsal edges of the segments somewhat thickened, especially in the outer half of the cirri; penultimate segment slightly less in diameter than those preceding; opposing spine very small, terminal; terminal claw about as long as the penultimate segment, slender, slightly curved; cirri moderately compressed laterally.

Ten arms 211 mm. long; arm bases and arms essentially as in *C. aculeata*, but much more rugged; IBr₂ with a prominent dorso-ventrally elongate well-rounded tubercle; second brachial similar; following brachials, to the fourteenth, with prominent rounded median tubercles as long as the segments; after the fourteenth these tubercles become high thick overlapping spines, whose bases occupy the entire dorsal median line of the segments; terminally these spines gradually decrease in height and eventually disappear.

The genital pinnules are expanded as in *Glyptometra*.

Type.—Cat. No. 27505, U.S.N.M., from station 5348.

Two smaller specimens were also secured at this station; one of these is about the size of the type of *C. aculeata*; it is easily distinguished by the much longer and more sharply conical centrodorsal and by the dorsal ornamentation of the arms which, though not so developed as in the adult, is yet prominently marked; the cirrus segments are longer than those of *C. aculeata*; the other specimen has arms only 55 mm. long; the dorsal ornamentation is only just beginning to appear, but is already of the type characteristic of

the adult; the peripheral cirri are XIV, 19–20, 21 mm. long; the centrodorsal is of the characteristic shape.

Station 5349.—One large specimen resembling the type.

Suborder MACROPHREATA.

Family ANTEDONIDÆ.

Subfamily ANTEDONINÆ.

Genus IRIDOMETRA.

IRIDOMETRA EXQUISITA A. H. Clark.

Station 5483.—One specimen with arms about 50 mm. long and cirri 11 mm. long, somewhat more robust than the type.

IRIDOMETRA PARVICIRRA (P. H. Carpenter).

Station 5355.—One specimen.

IRIDOMETRA MELPOMENE, new species.

Centrodorsal low, hemispherical, the small dorsal pole papillose; cirrus sockets arranged in three or four closely crowded alternating rows, the proximal with four sockets in each radial area.

Cirri XXX–L, 15–19 (usually 16–18) 10 mm. to 14 mm. (usually 12 mm. to 14 mm.) long, very slender, and strongly compressed laterally; first two segments about twice as broad as long, third slightly longer than broad, fourth or fifth to sixth or eighth three to four times as long as broad, the following gradually decreasing in length, the four to six outermost segments being about half again as long as their distal diameter; both ends of the long lower segments and the distal end of the shorter outer segments somewhat enlarged; no dorsal spines; opposing spine prominent, terminal directed slightly anteriorly.

The calyx and arms resemble those of *I. adrestine*, to which species this new form is most closely allied.

P_1 7.5 mm. long, moderately slender, with sixteen segments, the more distal somewhat over twice as long as broad; P_2 similar, 8 mm. long with sixteen segments; P_3 6 mm. long with thirteen segments; P_4 5 mm. long; following pinnules similar, gradually becoming longer, reaching a length of 9 mm. distally.

The color is a light yellow brown, the sides of the arms and of the division series, and the cirri, white; the perisome is dark purple.

Type.—Cat. No. 27506, U.S.N.M., from station 5311.

Five other specimens were obtained at this station.

TOXOMETRA, new genus.

Centrodorsal small, the cirrus sockets in three closely crowded alternating rows.

Cirri XVII-XXIX, 9-12, in general resembling those of *Antedon*.

Calyx and brachial structure essentially as in *Antedon*, but the ossicles have very strongly produced and serrate distal ends.

Lower pinnules somewhat stiffened; P_3 is the longest, and P_1 is shorter than P_2 ; P_4 is slightly longer than P_2 , and P_5 is slightly longer than P_1 ; the distal pinnules are about as long as P_2 .

Genotype.—*Toxometra paupera*, new species.

TOXOMETRA PAUPERA, new species.

Centrodorsal small, low hemispherical or thin discoidal, the bare dorsal pole about 1 mm. in diameter; cirrus sockets arranged in three closely crowded alternating rows.

Cirri XXII, 11-12 (usually 11), 7 mm. long; first segment short, second twice as broad as long, third one-third to one-half again as long as broad, fourth about twice as long as the median diameter; fifth not quite so long as the fourth; following segments gradually decreasing in length, the antepenultimate being about one-third longer than broad and the penultimate only slightly if at all longer than broad; third and following segments slightly constricted centrally with rather prominent ends, this character gradually dying away distally; fourth and following with a slight serrate production of the distal dorsal edge, but not sufficient to appear in lateral view as a definite process; opposing spine prominent, though small, terminal or subterminal, slightly longer than the penultimate segment, rather slender, moderately and evenly curved.

Radials even with the edge of the centrodorsal; IBr_1 short, oblong, three times as broad as long, just in contact basally, the anterior border rather prominently everted, and with a prominent dorso-ventrally elongated tubercle occupying the outer half or two-thirds of the median line; IBr_2 almost triangular, about twice as broad as long, the lateral edges about one-half as long as those of the IBr_1 , the anterior edges, like those of the IBr_1 , strongly everted and very finely serrate, and with a very prominent dorso-ventrally elongate tubercle in the proximal two-thirds.

Ten slender arms 80 mm. long; first brachial slightly wedge-shaped, twice as broad as the median length, interiorly united for the basal half, the inner sides diverging at a right angle beyond the farthest point of union; the distal edge is everted and there is a median tubercle in the distal half as on the IBr_1 ; second brachial about the same size, but much more obliquely wedge-shaped; the distal edge is strongly everted and there is a median tubercle in the proximal half; third and fourth brachials (syzygial pair) slightly longer interiorly

than exteriorly, about as broad as the median length, with the distal edge very strongly everted and the syzygial line raised into a sharp ridge; next three brachials slightly wedge-shaped, twice as broad as the median length, the distal edges very strongly everted, then becoming very obliquely wedge-shaped, almost triangular, about as long as broad, with the distal edges strongly produced and serrate, and after the second syzygy longer than broad, gradually decreasing in obliquity and increasing in length distally so that the outer brachials are twice as long as broad; the production of the distal edges of the brachials becomes rather less marked after the proximal fourth of the arm. but persists to the tip.

Syzygies occur between the third and fourth brachials, again between the ninth and tenth and fourteenth and fifteenth, and distally at intervals of three oblique muscular articulations.

P_1 4.5 mm. long, slender, rather stiff, evenly tapering to a pointed tip, with twelve segments, the first about twice as broad as long, the second and third about as broad as long or slightly longer, the following increasing in length, the distal being about three times as long as broad; P_2 6 mm. long, similar to P_1 but proportionately stouter, with about fourteen segments, the distal rather more elongated than those of P_1 ; P_3 7 mm. to 7.5 mm. long, similar to P_2 , but proportionately stouter, with seventeen segments, the outer with slightly produced distal ends; P_4 6.5 mm. long, about as stout basally as P_3 but more slender distally, the outer segments with more prominent distal ends; P_5 5 mm. long, nearly as stout basally as P_4 , but more slender distally and with longer segments; following pinnules similar to P_5 , gradually becoming longer and more slender; the distal pinnules are 6 mm. long.

The color is brownish yellow, with the perisome dark brown.

Type.—Cat. No. 27507, U.S.N.M., from station 5519.

Three additional specimens were secured at this station; one has the arms 70 mm. long and the cirri XVII, 9–10, 6 mm. long; another has the arms 75 mm. long and the cirri XIX, 9–12, 7 mm. long; and the third has the arms 65 mm. long and the cirri XIX, 10–11.

Station 5536.—One specimen with arms 55 mm. long and cirri XXIX, 10–12, 5 mm. long.

Subfamily PEROMETRINÆ.

Genus PEROMETRA.

PEROMETRA PUSILLA (P. H. Carpenter).

In the *Challenger* report Carpenter described, under the name of *Antedon pusilla*, a small comatulid from near the Ki Islands; he referred this species to his "*Basicurva* group," of which, together with his *Antedon denticulata*, it formed a section distinguished by the absence of ambulacral plating from all the other species.

Recent consideration of this form in connection with the present collection led me to suspect that it was related to *Antedon diomedæ*, which I described from southern Japan and subsequently made the type of the genus *Perometra*. Now *Perometra* belongs to a subfamily of Antedonidæ, all the species of which are remarkable for their deficient pinnulation; in *Perometra diomedæ* the first inner pinnule, P_a (the "pinnule on the third brachial") is always absent. Carpenter says nothing about the absence of any pinnules in *Antedon pusilla*, but as he had overlooked the absence of P_a in describing his *Antedon perspinosa*, I thought that perhaps a similar oversight had occurred here. I therefore wrote to Professor Bell asking him to investigate the point for me. With his usual kindness he has done this, and he writes, "I have, as you requested, made an examination of the type of Carpenter's *Antedon pusilla* and, so far as I can see, there is no pinnule on the third brachial."^a

As in all other ways *Antedon pusilla* shows a general agreement with *A. diomedæ*, the type of the genus *Perometra*, it must also be placed in that genus.

Professor Bell adds that the type of *Antedon pusilla* is obviously immature and regrets that it was described as a new species. I agree with him and share his regret in regard to the species, though it is of considerable interest to know that the genus *Perometra* occurs in the Ki Islands.

Plenty of material of *Perometra diomedæ* is available, showing all stages, from the very young to the adult; but the true status of *P. pusilla* can not be ascertained until more specimens have been secured.

Subfamily ZENOMETRINÆ.

Genus PSATHYROMETRA.

PSATHYROMETRA PARVA, new species.

Nearest to *P. mira*; the centrodorsal is as high as in that species, but is much narrower basally (4 mm. in length by 3.2 mm. broad at the base), so that it is considerably more pointed; the cirrus sockets are in two converging columns in each radial area, two or three to a column; there is no cirrus sockets between the proximal ends of the two columns as in *P. mira*, but sometimes one of the proximal cirrus sockets of a column may be displaced more or less inwardly; the bare interradiial areas are as broad as in *P. mira*, but somewhat less concave. The calyx and arms resemble, in so far as they are preserved, those of *P. mira*.

Type.—Cat. No. 27508, U.S.N.M., from station 5284.

^aSince the above was written I have personally examined the type of this species in London, and I find it to be undoubtedly referable to *Perometra*, though the first inner pinnule is present in all cases.

Subfamily HELIOMETRINÆ.

Genus TRICHOMETRA.

TRICHOMETRA EXPLICATA A. H. Clark.

Station 5349.—One small mutilated specimen, agreeing fairly well with the type.

Subfamily THYSANOMETRINÆ.

Genus EUMETRA.

EUMETRA CHAMBERLAINI A. H. Clark.

Station 5277.—One specimen with cirri 30 mm. to 40 mm. long composed of from 26–33 (usually 26) segments; the long peripheral cirri are lacking in the two specimens previously known.

The color is brownish yellow, the cirri and pinnules blotched with purple; the lower pinnules are slightly stouter than in the type, with slightly shorter segments, but the relative proportions are the same. The whole animal is throughout slightly stouter than the type.